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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/743,634	03/16/2001	Hans-Peter Burvenich	3268-0115P	5761

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EXAMINER

MASINICK, MICHAEL D

ART UNIT	PAPER NUMBER
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2125

DATE MAILED: 03/10/2004

17

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/743,634

Applicant(s)

BURVENICH ET AL.

Examiner

Michael D Masinick

Art Unit

2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-6, 8, 10, 11, 13, 15, 16, 18-23 and 26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-6, 8, 10, 11, 13, 15, 16, 18-23, and 26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Response to Amendment

Applicants amendments and arguments are found to be non-persuasive. All rejections are maintained as previously written with the addition of the the Georgiades patent which clarifies the reasons to combine. Since the same arguments were made in response to the last office action, the examiner also repeats the same response and reiterates that it would have been obvious to one of ordinary skill looking for a better way to do scheduling in ANY application to turn to genetic algorithms. Applicant states that this has never been done in a continuous rolling plant, with which the examiner agrees, however, this is the reason that the rejection is a 103 rejection.

In response to applicant's argument that the combination of Lee and Shaefer is not a valid combination, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

1. Furthermore, in the present case, one skilled in the art looking to solve the problem of scheduling by computer, would have found it obvious to look to genetic algorithms in order to come up with the best schedule. As further support for this combination, Examiner has cited US. Patent No. 5,404,516 to Georgiades et al which clearly shows the well known use of genetic algorithms for scheduling applications (Col 3, lines 16-23).

Art Unit: 2125

2. In this case, the fact that Lee fails to teach or suggest the use of genetic algorithms in conjunction with continuous rolling and casting plants is irrelevant. The test for obviousness clearly states, as noted in the applicants response on page 10, that the suggestion or teaching may come explicitly from (C) the nature of the problem to be solved. The problem of Lee is the scheduling system and finding the best schedule. Genetic algorithms have been clearly shown to provide excellent results in scheduling applications by both Georgiades and Shaefer. Thus, they fall into the same problem solving area and the combination is proper.

3. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

4. See above paragraph for examiners response on motivation to combine.

5. Finally in response to applicants closing question regarding the use of genetic algorithms in industrial applications, Examiner cites the following US Patents as further clear evidence that one of ordinary skill in the art at the time of invention would have used genetic algorithms in the industrial application of Lee:

6. U.S. Patent No. 5,745,361 to Kim et al

7. U.S. Patent No. 5,930,780 to Hughes et al

Art Unit: 2125

8. Applicant has overcome all previous 112 rejection and they have been removed.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4-6, 8, 10, 11, 13, 15, 16, 18-23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,808,891 to Lee et al in view of U.S. Patent No. 5,222,192 to Shaefer and further in view of U.S. Patent No. 5,404,516 to Georgiades et al.

3. Referring to claims 1, 6, 20-22, Lee shows a continuous casting and rolling plant, and a method of operating a continuous casting and rolling plant with a computing unit, including a plurality of slabs belonging to different production orders within sequences on the continuous casting and rolling plant ("Order Load", Abstract), comprising: determining a solution indicating the order of the slabs belonging to the production orders within the sequences with the computing unit, and controlling the continuous casting and rolling plant by the computing unit in accordance with the order determined (Col 6, lines 53-61), wherein controlling the continuous casting plant by the computing unit includes defining an operational sequence for the entire continuous casting and rolling plant (schedules as shown above).

4. Lee does not show that the order determination step is accomplished by using genetic algorithms. Lee also does not show evaluating the solution by and event-oriented evaluation,

Art Unit: 2125

wherein the event-oriented evaluation is carried out by simulating the operation of the continuous casting and rolling plant.

5. Shaefer shows the use of Genetic Algorithms as a problem solving technique where random optimization is needed (Abstract, Patent Subject) and goes into deep detail about genetic algorithms and their role in problem solving techniques.

6. Georgiades shows a system for allocating resources where genetic algorithms are used in a manufacturing environment. The “final evaluation processor” of Georgiades (col 5, line 56 – col 6 line 14) shows evaluating the potential solutions to determine the “fitness” of each solution.

7. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the Genetic Algorithms of Shaefer and Georgiades in place of the optimization technique of Lee because genetic algorithms provide “extraordinarily quick discovery of early approximate solutions” (Shaefer, Col 3, lines 43-50) and the optimization and final evaluation processor of Georgiades provides for the evaluation step and shows that scheduling using genetic algorithms in scheduling and management environments is well known. This substitution is also made for all inherent traits of genetic algorithms as are shown with relation to Shaefer below.

8. Specifically with regards to claims 21 and 22, the goal of genetic algorithms in this application is to determine a “solution space” or schedule (starting point) for operating the casting plant.

9. Referring to claim 2, Shaefer shows wherein at least one of a selection, a recombination, or a mutation is carried out by the genetic algorithm (“mutation”, Col 3, lines 27-34).

10. Examiner notes that these are all inherent functions of a Genetic Algorithm.

11. Referring to claims 4 and 10, Shaefer shows wherein the order of the slabs belonging to the production orders within the sequences is determined with the computing unit by an event-oriented evaluation (Fig. 5 and Col 8, lines 62-65) according to the quality of the solutions.
12. Examiner notes that an evaluation according to quality step is inherent to the use of genetic algorithms.
13. Referring to claims 5, and 11, 13, and 15, Shaefer shows where a starting solution, as a starting point, is determined by the computing unit (Col 2, lines 3-6).
14. Examiner notes that creating a random starting point is inherent to all genetic algorithms and would inherently be selected by the computing unit.
15. Referring to claim 8, Lee shows wherein the continuous casting and rolling plant is a thin-slab continuous casting and rolling plant ("Rolled to desired thickness", Col 2, lines 22-28).
16. Referring to claims 16, 18, and 19, Lee shows a continuous casting and rolling plant wherein the plurality of slabs which belong to different production orders are produced within sequences on the continuous casting and rolling plant ("Order Load", Abstract), wherein the computing unit determines the order of the slabs belonging to the production orders within the sequences (Col 6, lines 53-61).
- 17.

Art Unit: 2125

18. Referring to claim 23, Georgiades shows wherein the data pertains to at least one of delivery dates, quantities to be delivered, and order-related restrictions. Examiner notes that asset scheduling systems as clearly shown in Georgiades would obviously take into account deliver dates of the assets being scheduled.

19.

20. Referring to claim 26, Lee shows wherein technical characteristics of the continuous casting and rolling plant are evaluated during the simulating step, the technical characteristics including at least a number and type of continuous caster. Lee clearly shows creating a schedule for a casting and rolling plant which would contain a number and type of continuous caster.

Conclusion

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

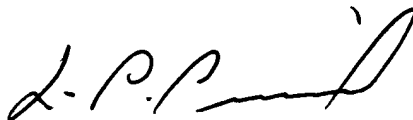
Art Unit: 2125

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael D Masinick whose telephone number is (703) 305-7738. The examiner can normally be reached on Mon-Fri, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on (703) 308-0538. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7239 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

mdm
March 1, 2004



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